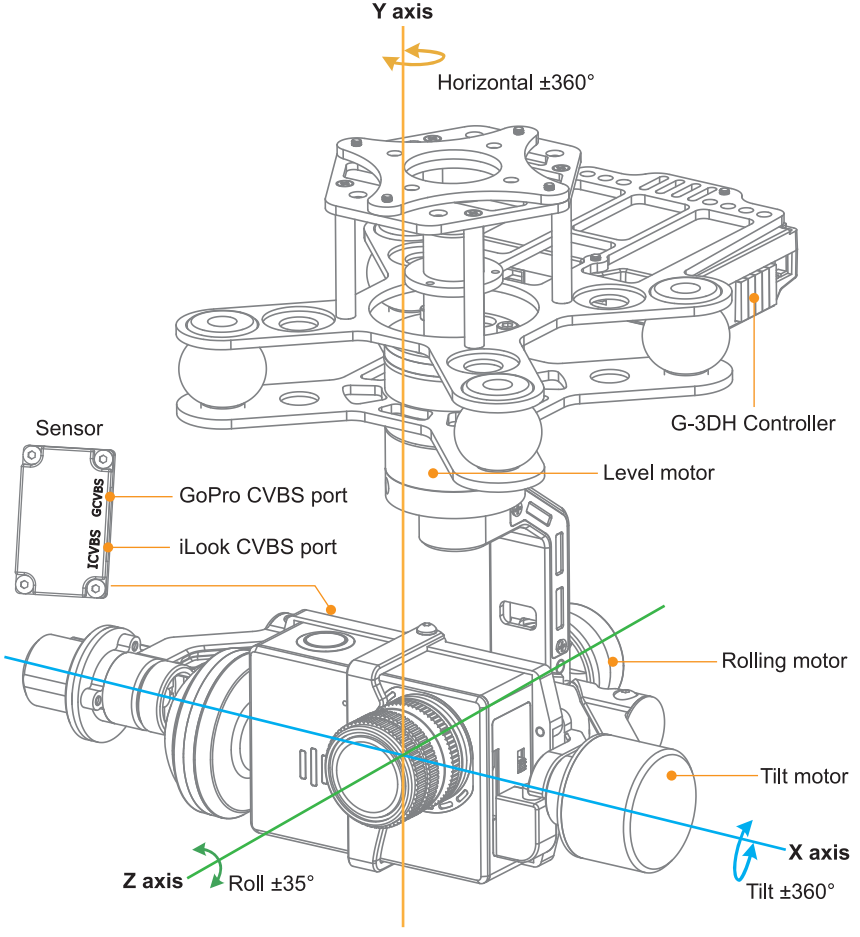
G-3DH Gimbal User Manual

G-3DH Gimbal is a high-precision and portable Gimbal specifically designed for iLook, iLook+, Gopro series cameras by Walkera. Adopting aluminum alloy CNC precision machining, brushless motor drive, high accuracy intelligent electronic control system, it can be widely applied to film photography, advertising aerial photography etc. The highly precise and stable structure can ensure the aircraft accurately control the mounted camera to keep stable during high-speed flying and take the best aerial photography pictures and videos.



1.0 Features and Technical Parameters

(1) Support iLook, iLook+, Gopro series camera video auxiliary output.

(2) Support power supply voltage compensation.

(3) Support the motor drive end short circuit protection.

(4) Support initial tilt and roll angle custom.

(5) Support stick position mode and rate mode.

(6) Support Reset mode, Orientation-locked mode and Non orientation-locked mode.

(7) Support regular receiver.

(8) Operating voltage: DC 7.4V~28V (recommended 12V, 3S lipo battery).

(9) Operating current: 500mA-600mA (depends on the voltage supplied and motor power).

(10) Operating temperature: -15℃~ 65℃.

(11) Sensor: 3-axis MEMS gyro and 3-axis MEMS accelerometer.

(12) Control accuracy: 0.02°.

(13) Controllable rotation range: tilt ±360° continuous rotation, roll ±35°, Horizontal ±360° continuous rotation.

(14) Applicable camera: iLook, iLook+, Gopro series.

(15) Size: 148mm x 155mm x 147mm(L x W x H).

(16) Weight: 277g(Without camera).

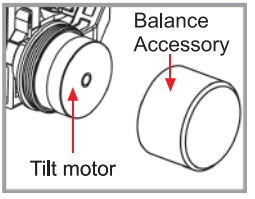
(17) The controller program can be upgraded on Walkera website (UP02 and UP02 adapter requested).

2.0 Matters needing attention

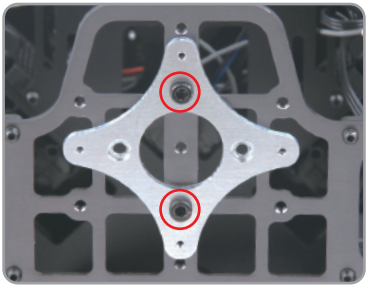
(1) Keep lens in the same direction with the aircraft head.

(2) When Gimbal is assembled with camera and meet the Gimbal barycenter is unbalanced, assemble Gimbal Balance Accessory is necessary.

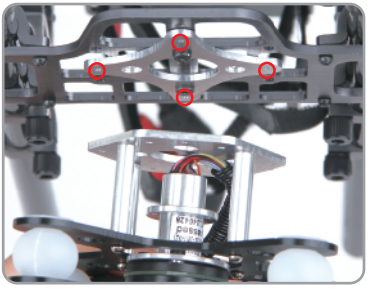
(3) Please make sure the Gimbal equipped with camera before power on, otherwise it will effect the accuracy in calibration.



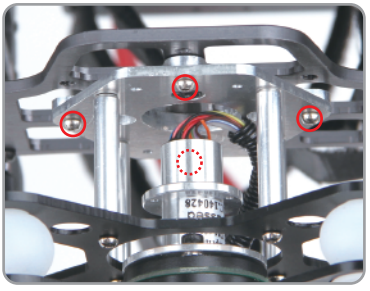
3.0 Instruction for standard installation (QR X800 as example)



3.1 Install gimbal fix holder A to the bottom of aircraft body with 2pcs hex head screws M3X8.



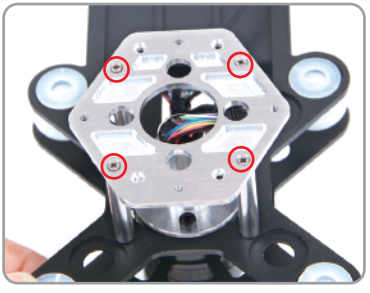
3.2 Point the gimbal at the screw hole on the gimbal fixing frame A.



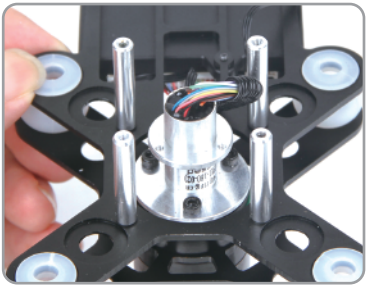
3.3 Fix the gimbal by using 4 pieces of hexagon socket button head screws M2x4.

3.4 Install the camera to the gimbal and fix it.

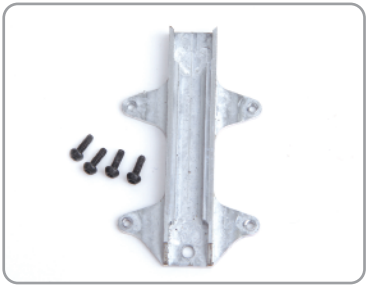
4.0 Instruction for optional installation (QR X800 as example)



4.1 Unscrew the 4 cross recessed countersunk head screws KM2x6 over the gimbal fixing frame B and then remove the gimbal fixing frame B.

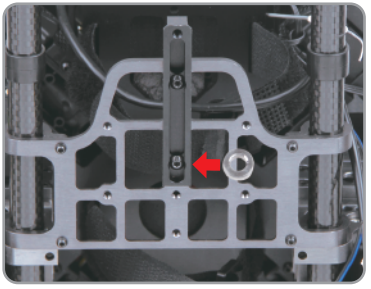


4.2 Here is the effect picture for your reference when the gimbal fixing frame B is removed.

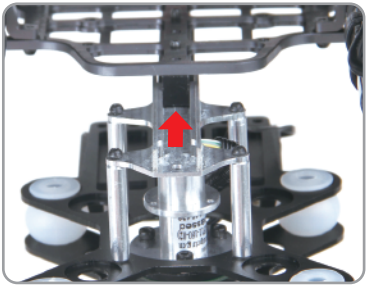


4.3 Prepare the gimbal fixing frame C and 4 pieces of hexagon socket button head screws M2x6.

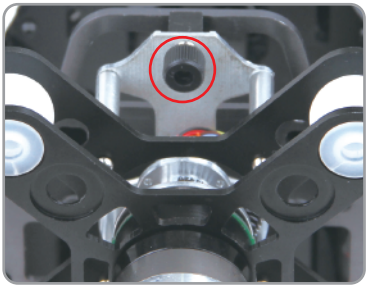
4.4 Install the gimbal fixing frame C and fix it by using 4 pieces of hexagon socket button head screws M2x6.



4.5 Install the gimbal fixing block at the bottom of aircraft body by using 2 pieces of hexagon socket head cap screws M3X8. (Please add gaskets at the end)



4.6 Point the gimbal chute at the gimbal fixing block and install it under the gimbal fixing block in the direction shown by the arrow.



4.7 Install the spring into hexagon socket head cap screws M3X12. Point the screw at the thread hole, tighten and fix the gimbal.

4.8 Install the camera to the gimbal and fix it.

Attention: pictures just for reference, please subject to actual object.

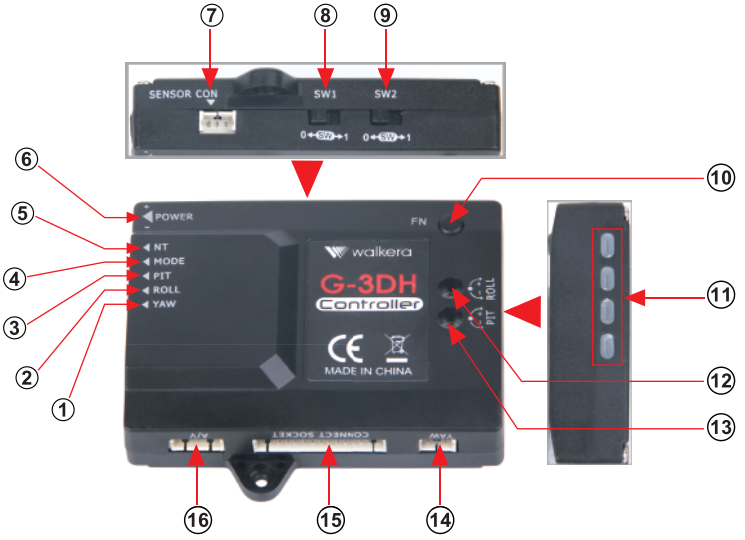
5.0 Instruction of Working Mode

Note: (1) Gimbal pointing means the Y axis horizontal rotation angle of the gimbal.

(2) Attitude stability means that gimbal's ROLL/Tilt will not follows the aircraft's ROLL/PITCH.

	Stick Position Mode	Stick Rate Mode	Orientation-locked Mode(Y axis)	Non orientation-locked Mode(Y axis)	Reset mode (Y axis)
Definition	Adjust tilt and roll angle throught transmitter tilt and roll stick	Adjust tilt and roll change rate throught transmitter tilt and roll stick	Gimbal pointing moves with aircraft nose direction	Gimbal pointing stays unchanged when aircraft nose moves	Gimbal pointing stays the same as aircraft nose direction when power up
Gimbal and Aircraft Nose Relative Angle	————	————	Gimbal pointing keeps the same relative angle with aircraft nose direction	The relative angle between gimbal pointing and aircraft nose direction is changeable	The relative angle between gimbal pointing and aircraft nose is 0°
TX Control	Controllable	Controllable	Controllable	Controllable	Uncontrollable
Attitude stability	YES	YES	YES	YES	YES
Vibration Reduction	YES	YES	YES	YES	YES
Stick Meaning	Tilt ±180°; Roll ±35°; Meso-position angle is 0°, the max angle is at the endpoint.	Tilt ±360° continuous rotation; Roll ±35°; The median speed is 0°, the max speed is at the endpoint	Horizontal rotation ±45°; The median speed is 0°, the max speed is at the endpoint. Tiltn and Roll is to stick position mode and stick rate mode.	Horizontal rotation ±360° continuous rotation; The median speed is 0°, the max speed is at the endpoint. Tilt and Roll is to stick position mode and stick rate mode.	Tilt and Roll is to stick position mode and stick rate mode.
Command Linearity	YES	YES	YES	YES	————

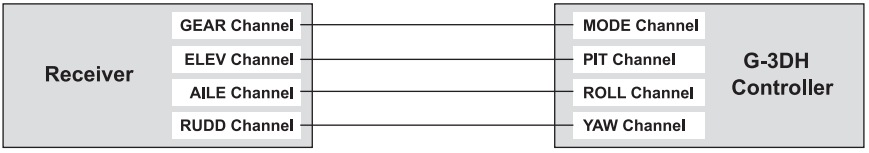
6.0 Function



S/N	G-3DH Connector	Function
①	**YAW**	To control the gimbal horizontal rotating direction, entering into the receiver rotating channel(RUDD).
②	**ROLL**	To control the gimbal roll (left / right), entering into the receiver rolling channel(AILE).
③	**PIT**	To control the gimbal tilt (left / right), entering into the receiver tilting channel(ELEV).
④	**MODE**	Used to select the working mode, entering into the working mode channel(GEAR).
⑤	**NT**	Not used
⑥	**POWER**	Power input DC 7.4V~28V(recommended 12V, 3S lipo battery).
⑦	**SENCOR CON**	Connect with the angle sensor
⑧	**Toggle switch SW1** (0←SW→1)	Switch between stick position mode (position 0) and rate mode (position 1).
⑨	**Toggle switch SW2** (0←SW→1)	Switch between reset mode (position 0) and non orientation-locked mode (position 1).
⑩	**Function keys(FN)**	Function selection keys when enter into adjusting mode.
⑪	**Indicator (G/R/B/Y)**	Operating status indication (green / red / blue / yellow light).
⑫	**ROLL Knob**	AUX knob.

S/N	G-3DH Connector	Function
⑬	**PIT Knob**	AUX knob.
⑭	**Level motor connector(YAW)**	Connect with the level motor.
⑮	**CONNECT SOCKET**	Connect with the 15 cable.
⑯	**A/V**	For the transmission of video signals.

7.0 G-3DH controller and Receiver connection illustration



Attention: you can change the receiver connection port type basing on the situation.

8.0 Working Mode Switch Set

Select the three-position switch on transmitter as switch for work pattern, please connect the corresponding port on the receiver to the Mode channel of the gimbal controller. Please use the channel route fine-tuning of the transmitter and channel reverse function at different gears, settings are as follows:

Working Mode	Mode channel	Mode channel Travel	Three-position switch	Mode channel reverse
Orientation-locked Mode	"+" Port	+80% ~ +100%	Switch position "2"	Normal
Reset mode	Back to center	0	Switch position "1"	
Non orientation-locked Mode	"-" Port	-80% ~ -100%	Switch position "0"	

Tips:

(1) You can interchange working mode of switch position "2" and "0" through Mode channel reverse.

(2) One 2-position switch can be assigned for any two of the working modes as you like.

(3) Gimbal default works in Reset mode after power on.

(4) The gimbal will maintain the Working Mode from last moment, if the cable between MODE and RC receiver is disconnecting while working.

9.0 Instruction without connecting receiver

9.1 Knob function and adjust method

PIT Knob	Adjusting tilt angle(midpoint is 0°, angel range is ±180°)
ROLL Knob	Adjusting roll angle(midpoint is 0°, angel range is ±35°)

Put the gimbal on the horizontal position, initialization, red LED flash, initialization finished, green LED keeps solid, you can adjust the tilt and rolling angle according to the gimbal status.

(1) If you want the gimbal forward, please adjust the **PIT knob** in counterclockwise direction, and vice versa.

(2) If you want the gimbal leftward, please adjust the **ROLL knob** in counterclockwise direction, and vice versa.

9.2 Toggle switch SW2(0←SW→1) instructions

Toggle switch to '0' positon is the Reset mode,
toggle switch to '1' positon is non orientation-locked mode.

10.0 Instruction with connecting receiver

10.1 Knob function and setting method

PIT Knob	Adjusting tilt angle(maximum ±180°)
ROLL Knob	Adjusting roll angle(maximum ±35°)

Put the gimbal on the horizontal position, initialization, red LED flash, initialization finished, green LED keeps solid, you can adjust the tilt and roll angle according to your needs.

(1) Take the mid-point as start point, you can adjust the PIT knob in counterclockwise direction as needed to set the tilt range(maximum ±180°);

(2) Take the mid-point as start point, you can adjust the ROLL knob in counterclockwise direction as needed to set the ROLL range(maximum ±35°);

10.2 Toggle switch SW1(0←SW→1) instructions

Toggle switch to '0' positon is the stick position mode,
toggle switch to '1' positon is stick rate mode, suggest use the stick position mode.

10.3 Instruction for working mode and 5.0 working mode

11.0 Adjusting parameter mode instruction

11.1 Knob function

PIT Knob	Adjusting motor gain control.
ROLL Knob	Adjusting motor output power.

11.2 Parameters adjustment principles

In the case of changing the camera on gimbal, adjust the parameters according to the load conditions. Under the same load conditions, when the motor output power increases, you must reduce the motor control gain. And when the motor output decreases, you can appropriately increase the control gain. Therefore, when the electrical power is enough, by reducing the motor power, you can get larger control gain and then get a better stabilization effect. But when the motor power is reduced, the gimbal's ability to resist the disturbance will be reduced at the same time.

11.3 Adjustment methods

Put the gimbal in horizontal position. Power on and enter into the electricity initialization state. The red light flashes up first and then the green light will be constant after the red light passes through. Under this condition, you can enter the reference model to adjust gimbal parameters when it is necessary.

11.3.1 Enter Into PAM Instructions

Press function key(FN) over 3 seconds, Red/Blue/Yellow LED flash quickly simultaneously indicating PAM entered.

11.3.2 Tilt motor output power and Gain Control Adjusting

(1) Enter into PAM, press function key(FN) once until red LED flashes quickly indicating tilt Motor Output Power and Gain Control Adjusting mode entered.

(2) Reset PIT/ROLL knob that means adjusting PIT/ROLL knob at middle position, blue/yellow LED keep solid constantly.

(3) Please wait 3~5 seconds until red LED flashes slowly, then you can adjust the tilt motor output power and gain control. ①To increase the tilt motor output power, please adjust the ROLL knob clockwise properly and yellow LED flashing, and vice versa. ②To increase the tilt motor gain, please adjust the PIT knob clockwise properly and blue LED flashing and vice versa.

(4) Press function key(FN) triple until Green LED keeps solid, adjusting parameters will be saved and exit PAM.

11.3.3 Roll motor output power and Gain Control Adjusting

(1) Enter into PAM, press function key(FN) twice until blue LED flashes quickly indicating roll motor output power and Gain Control Adjusting mode entered.

(2) Reset PIT/ROLL knob that means adjusting PIT/ROLL knob at middle position, red/yellow LED keep solid constantly.

(3) Please wait 3~5 seconds until blue LED flashes slowly, then you can adjust the Roll motor output power and gain control.

① To increase the Roll motor output power, please adjust the ROLL knob clockwise properly and yellow LED flashing, and vice versa.

② To increase the Roll motor gain, please adjust the PIT knob clockwise properly and red LED flashing and vice versa.

(4) Press function key(FN) twice until Green LED keeps solid, adjusting parameters will be saved and exit PAM.

11.3.4 Level motor output power and Gain Control Adjusting

(1) Enter into PAM, press function key(FN) triple until yellow LED flashes quickly indicating level motor output power and Gain Control Adjusting mode entered.

(2) Reset PIT/ROLL knob that means adjusting PIT/ROLL knob at middle position, red/blue LED keep solid constantly.

(3) Please wait 3~5 seconds until yellow LED flashes slowly, then you can adjust the level motor output power and gain control.

① To increase the level motor output power, please adjust the ROLL knob clockwise properly and blue LED flashing, and vice versa.

② To increase the level motor gain, please adjust the PIT knob clockwise properly and red LED flashing and vice versa.

(4) Press function key(FN) once until Green LED keeps solid, adjusting parameters will be saved and exit PAM.

11.3.5 Parameters save and PAM exit

Enter into PAM, Press function key(FN) four times until green LED keeps solid, adjusting parameters will be saved and exit PAM.

Remark: Please adjusting PIT/ROLL knob to middle position after PAM exit.

12.0 Adjusting parameter mode instruction

(1) Motor output short circuit protection:

When the motor output end short circuit, the controller will cut off the motor output automatically to protect the controller not burn. When the short circuit problem be solved, please re-connect the power supply again to unlock the protection.

(2) Angle overrun protection:

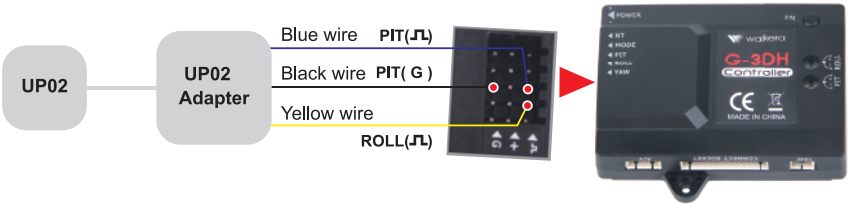
When the camera overrun, the controller will cut the motor output automatically to protect the wires not twist off under unexpected condition unless problems solved.

13.0 G-3DH program upgrade

(1) The G-3DH program can be update online, new program will be released on Walkera website.

(2) Upgrade tool: UP02 and UP02 adaptor.

(3) Put the blue single plug inside the PIT signal port(⎍), put yellow single plug inside the ROLL signal port(⎍), and put the black single plug inside the ground port (G).



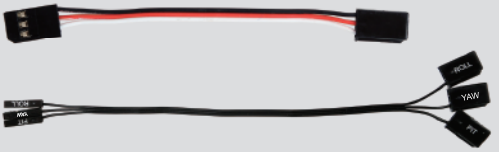
14.0 Connection cable instruction

iLook/iLook+ CVBS wire: used to connect gimbal ICVBS port and iLook/iLook+ camera

Gopro CVBS wire: used to connect gimbal GCVBS port and Gopro camera

AV SIG / Camera SIG. wire: used to connect gimbal A/V port and 5.8G emitter/camera controller

Servo wire: used to connect gimbal MODE/PIT/ROLL/YAW channel and receiver corresponding channel(Put a single plug inside the signal port ⎍)



Power wire: used to connect gimbal power port and aircraft power

Work instructions

Disconnect/ connect with receiver	Red LED flashes quickly	Electricity in the initialization, please keep the gimbal still
	Green LED keeps solid	Initialization finished
Connect with receiver	Red LED keeps solid	Receiver Tilting channel be connected.
	Blue LED keeps solid	Receiver Rolling channel be connected.
	Yellow LED keeps solid	Receiver rotation channel be connected.
Enter PAM	Red/blue/yellow LED flashes quickly simultaneously	Enter PAM
Tilt Motor Output Power and Gain Control Adjusting	Red LED flashes quickly/slowly	Enter Tilt Motor Output Power and Gain Control Adjustment
	Blue LED light off/ keeps solid/ flash	PIT knob isn't in the middle/in the middle/ under adjusting
	Yellow LED light off/ keeps solid/ flash	ROLL knob isn't in the middle/ in the middle/under adjusting
Roll Motor Output Power and Gain Control Adjusting	Blue LED flashes quickly/ slowly	Enter Roll Motor Output Power and Gain Control Adjustment
	Red LED light off/ keeps solid/ flash	PIT knob isn't in the middle/in the middle/ under adjusting
	Yellow LED light off/ keeps solid/ flash	ROLL knob isn't in the middle/ in the middle/under adjusting
Level Motor Output Power and Gain Control Adjusting	Yellow LED flashes quickly/ slowly	Enter level Motor Output Power and Gain Control Adjustment
	Red LED light off/ keeps solid/ flash	PIT knob isn't in the middle/in the middle/ under adjusting
	Blue LED light off/ keeps solid/ flash	ROLL knob isn't in the middle/ in the middle/under adjusting
Parameters save and PAM exit	Green LED keeps solid	Save parameters and Exit PAM

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